JOINT FIRE SCIENCE PROGRAM
RESEARCH ACCOMPLISHMENT REPORT

1. TITLE OF PROJECT:
Evaluating the effects of prescribed fire and fuels treatment on water quality and aquatic habitat

2. RESEARCH UNIT:
Umatilla National Forest

3. FIELD LOCATION / STUDY SITES:
Blue Mountains, NE Oregon & SE Washington

4. JFSP PROJECT NUMBER:
01-3-3-18

5. TEAM LEAD SCIENTIST AND CONTACT INFORMATION:
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6. PROJECT OVERVIEW: (Short paragraph describing your research project – providing some background information and the approach taken)

This study is designed to examine the effects of prescribed fire and mechanical fuel treatments on surface erosion, stream sedimentation, channel morphology, and other water quality parameters. Intensive study sites are located in the Skookum Experimental Watersheds and a more extensive array of hillslope erosion plots are located in 3 additional fuel treatment projects in the Blue Mountains. The Skookum watersheds have been gauged and baseline data are available for stream discharge and sediment yield. We are measuring hillslope erosion, surface-sediment transport, and sediment delivery to streams on control and treatment sites within the Skookum Experimental Watersheds for one year prior to treatment, and for two years post treatment. The combination of gauged watersheds and long-term records of discharge, suspended sediment and bedload makes it possible to examine treatment effects using watershed-scale sediment budgets. Measurements from the extensive hillslope erosion plots are limited to rates of hillslope erosion and hillslope-sediment transport. The extensive plots are located on both control and treatment sites, but do not include any pre-treatment data. Data from both the watershed-scale study and the extensive plots will be used to refine erosion and sediment delivery models used in planning and assessing management activities.

7. ACCOMPLISHMENTS:
(Bullet statements describing the accomplishments to date. Include information about preliminary results, products developed and metrics used to measure success.)

- Established four hillslope erosion plot study areas with a total of 126 erosion plots
- Completed prescribed burning treatment on one study area
- Installed 10 rain gauges in the study areas at hillslope scale
- Measured fuel loads at three study areas at plot scale
- Completed 1 ½ years of erosion plot sampling
- Completed laboratory processing of more than 75% of the collected erosion plot samples
- Compiled 12 years of historical data for the Skookum Experimental Watershed
- Re-established and surveyed channel reference reaches in the control and treatment watersheds on Skookum Creek
- Completed major maintenance on the stream gauges at the Skookum Experimental Watershed

Preliminary findings include:

- Hillsope erosion rates appear to vary with aspect, with South aspects producing higher erosion rates
- Sediment delivery to valley floors and stream channels appears to be small compared to sediment yields from watersheds, suggesting hillslope and valley floor storage mechanisms, and episodic transport processes
- High annual variability of natural background water and sediment yields (with sediment varying an order of magnitude) may mask treatment effects. Climate and vegetation conditions strongly influence inter-annual variability.
- First year treatment results showed low overall hillslope erosion rates though significantly higher rates were found on South aspects.
- Rapid post-fire vegetative recovery and low intense rainfall during the first year may account for low erosion rates.
- In the absence of significant precipitation events, hillslope erosion may be more related to local factors including wildife (elk) impacts.

8. APPLICATION AND TECHNOLOGY TRANSFER:
(Describe how your research is being used and how it will help address wildland fire management issues. Include information about how are you transferring information to managers and field user groups)

Baseline data on the following watershed attributes: hillslope erosion, stream discharge, sediment loads and concentrations, water temperature, and channel morphology are being used to characterize background conditions and understand controlling factors at multiple spatial (hillslope to landscape) and temporal (seasonal to annual) scales. Post-treatment results are helping identify specific processes and timing of erosion, and controlling factors at the hillslope scale. These results will be useful in estimating project-level effects from future prescribed burn and fuel treatment projects. Results will also be used to locally calibrate predictive models such as WEPP.

Overall, results are helping to quantify effects of these types of treatments compared to natural background and wildfire effects. Information is being transferred to managers through various mechanisms including informal exchange – this project is managed on the Umatilla National Forest by local staff, which helps facilitate rapid exchange of information to local users.

9. PICTURES:
Please send any pictures that we could use in the annual Business Summary Report. Photos must be at least 300 DPI preferably in TIF or GIF format. Please do not send them imbedded in a Word or PowerPoint document. Photo credits must be included for all photos.

10. LINKAGES AND OTHER FUNDING SOURCES:

a. NFP RESEARCH FUNDING - (NFP project number and % of funding): 0%
b. OTHER (% of funding from other sources): 30%

11. RESEARCH METRICS: Please provide the requested information below, which the JFSP program office uses to answer other accomplishment questions.

Cumulative
(Initiation of project through 7/15/04)

Outputs:

Scientific Outputs:

No. of refereed publications	___0___
No. of non-refereed publications	___0___
No. of Presentations at scientific conferences	___4___

Technology Transfer Products:

No. of User Bulletins, Leaflets etc.	___0_
No. of Decision Support Tools/ Models Developed/Implemented	___0__
No. of Demonstrations/Tours Provided	___2__

Technical Assistance:

No. of Significant Consultations	
With Agency units	___1__
With States	___1__
With Tribal governments	___1__
With County, local governments	___0__
Other (specify)	
No. of Short courses/Training Programs/ Workshops given	___0___
Total number of attendees of short courses/ Training Programs/Workshops given	___0___
No. of Fire Management Units Assisted	___1___